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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,610	03/29/2004	Clive Clayton	8009-24	2715

7590 09/15/2005

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EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 09/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,610

Applicant(s)

CLAYTON ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9 and 16-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Claims 10-15 are canceled

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

RD

The amendment of August 10, 2005 has been received and entered.

Election/Restrictions

1. The Examiner notes that claims 10-15, which were non-elected with traverse in the phone election of April 5, 2005, have been canceled.
2. Applicant's cancellation of the non-elected claims 10-15 in the reply filed on August 10, 2005 is acknowledged. The restriction requirement was not further addressed. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the cancellation of the non-elected claims has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

3. The objection to the disclosure because of not making reference to the priority claim to provisional application 60/458,724, filed March 28, 2003, which is referred to in the transmittal papers is withdrawn due to applicant's August 10, 2005 amendment to provide such reference.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the amendment of August 10, 2005, new claims 16-18 are provided that require the depositing of a second thermal spray coating on the composite material, wherein "the second thermal spray coating is not densified" (see claims 16, 18). However, in the amendment, applicant provides no indication as to where in the disclosure as originally filed support for these new claims is provided. Upon review of the disclosure as originally filed, the Examiner finds support for the application of a second thermal spray coating, but no indication as to the densification or not densification of the second layer. Furthermore, there is no indication as to whether the "densified" as described in regard to the second coating would mean that it is not friction stir welded with the substrate or whether no densification treatment can be performed (such as pressure or heat treating). Therefore the new claims contain new matter.

6. The rejection of claims 1-3 and 6-8 under 35 U.S.C. 102(a or e) as being anticipated by Mahoney (US 2003/0042291) is withdrawn due to applicant's amendments to the claims of August 10, 2005.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney (US 2003/0042291) in view of Yen et al (US 4157923).

Mahoney teaches a method that provides for densification of a thermal spray coating. See paragraphs [0008] and [0031]. The method includes depositing a thermal spray coating on a substrate surface. Figures 4A and 4B and paragraph [0031] (layer 16). The thermal spray coating and the substrate are later mixed by friction stir welding

forming a composite material. Figures 5-6 and paragraphs [0033] – [0036]. Mahoney provides that a second workpiece is also mixed in with the thermal spray coating and the substrate during the friction stir welding. Figures 5-6.

Claim 2: the mixing causes metal flow of the thermal spray coating to a depth controlled by a nib of the friction stir coating weld tool into the substrate. Figures 5-6 and paragraphs [0033] – [0036].

Claim 3: the thermal spray coating can be deposited by plasma spray. Paragraph [0031].

Claim 6: the substrate can be a ferrous alloy. Paragraph [0028].

Claim 7: the substrate can be a non-ferrous alloy. Paragraph [0028].

Claim 8: the thermal spray coating can be a metal. Paragraph [0029].

Mahoney teaches all the features of the claims except that the composite material consists of the thermal spray coating and the substrate (without the second workpiece).

However, Yen teaches that it is well known to provide a substrate with a thermal spray coating, such as a plasma sprayed substrate, and to then to mix together the coating and substrate to form a composite material at the surface of the substrate that consists of the thermal spray coating and the substrate. Column 4, lines 45-55, column 5, lines 40-50 and figures 1-5. This is done by using by a high energy beam to melt the coating and substrate together. Column 4, lines 10-40. This provides a hardening of the substrate, for example. Column 2, lines 45-55. The substrate can be an aluminum alloy,

for example. Column 5, lines 1-15. The thermal spray coating can be a metal. Column 6, lines 15-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mahoney to also form a composite material by friction stir welding only a substrate and thermal spray layer as suggested by Yen with an expectation of providing a hardened substrate, because Mahoney teaches a method of forming a composite material into a substrate by friction stir welding materials that include a thermal spraying layer and a substrate, and Yen teaches that it is desirable to form a composite material on a substrate that consists of a mix of a thermal spray layer and a substrate in order to form a desirably hardened surface.

10. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8 above, and further in view of Lazarz et al (US 6227435).

Mahoney in view of Yen teaches all the features of these claims except powder flame spraying (claim 4) and two wire electric arc spraying (claim 5).

However, Lazarz teaches that a conventional method for applying metallic and other coatings is by thermal spraying. Column 1, lines 20-35. Thermal spraying processes all require a heat source, a propelling device and a feed material. Column 1, lines 25-35. Thermal spraying encompasses spraying powder and wire materials, by

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processes such as plasma spraying, flame spraying (combustion and HVOF) and electric arc spraying (including twin wire electric arc spraying). See column 1, lines 25-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mahoney in view of Yen to replace the plasma spraying with flame spraying of powder materials or twin wire electric arc spraying as suggested by Lazarz with an expectation of providing a desirable coating to be treated by friction stir welding because Mahoney in view of Yen teaches a method of coating a metal material that includes the thermal spray method of plasma spraying, and Lazarz teaches that when coating metal metals desirably plasma spraying or similar thermal spraying methods such as flame spraying and twin wire electric arc spraying can be used to apply the material from powder or wire.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8 above, and further in view of Sherman (US 2003/0012678).

Mahoney in view of Yen teaches all the features of this claim except determining a time between depositing the thermal spray coating and the friction stir welding according to a distance between a spray gun and a friction stir welding tool and a speed of the substrate relative to the gun and tool.

However, Sherman teaches applying a thermal spray coating to a substrate and then to densify the coating using a friction tool following behind. Figures 1 and 2 and

paragraphs [0012] – [0016], [0027] and [0032]. This provides a controlled time between the coating and the welding. Paragraph [0032] and figure 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mahoney in view of Yen to control the time between coating and welding as suggested by Sherman with an expectation of providing a desirably efficient coating treatment because Mahoney in view of Yen teaches a method that includes a thermal spray coating followed by a later friction welding treatment, and Sherman teaches that when thermal spray coating followed by a friction welding treatment, it is desired to perform the treatment as quickly as possible (see paragraph [0032]). One of ordinary skill in the art would perform routine experimentation to optimize the time between treatments based on the specific results desired and coating materials used.

12. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8 above, and further in view of Salito (US 6113991).

Mahoney in view of Yen teaches all the features of these claims except the depositing of a second, not densified, thermal spray coating.

However, Salito teaches that in the thermal spraying art, it is well known to provide a first layer on a substrate that mixes with the substrate and then to provide

further layers of thermal spray coating over the first layer that are not densified into the substrate. See figure 2 and column 2, lines 15-35 and column 3, lines 1-15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mahoney in view of Yen to apply further thermal spraying layers as suggested by Salito with an expectation of providing a desirably efficient coating treatment because Mahoney in view of Yen teaches a method that includes a thermal spray coating followed by a later friction welding treatment, and Salito teaches that when thermal spray coating a first layer on a substrate that mixes with the substrate, it is well known to provide further layers of thermal spray coating over the first layers that are not densified into the substrate.

Response to Arguments

13. Applicant's arguments with respect to claims 1-9 and 16-18 have been considered but are moot in view of the new ground(s) of rejection.

Yen has been provided as to the use of only a thermal spray layer for densification. Salito has been provided as to the use of multiple thermal spray layers.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.


Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER